

EXHIBIT D

Field Guide to
Spectroscopy

David W. Ball

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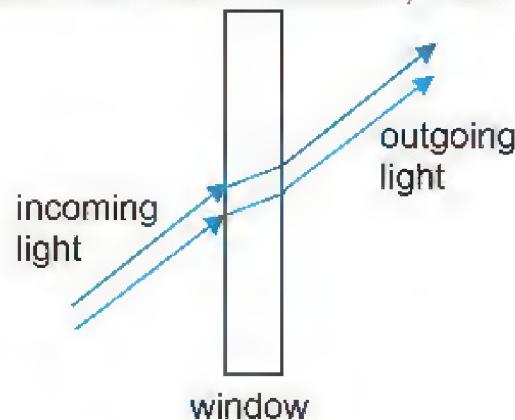
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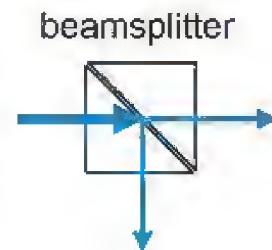
Other Components

A **window** is an optical component whose main function is to separate environments or serve as a substrate, but it has minimal effects on the spectral characteristics of the probing radiation. Windows typically have flat, parallel surfaces. The path of the light rays may be deflected but should not be dispersed.



Window materials can be any substance that does not absorb the light of interest. Transparent materials like glass, quartz, and sapphire are used in visible and UV regions. Ionic crystals like KBr, NaCl, CaF₂, or KRS-5 (mixed TlBr/TlI) can be used for the IR region, as can diamond. Polyethylene is used in the far-IR. Beryllium windows are used in x-ray and gamma ray spectroscopy.

A **beamsplitter** is an optical component that allows part of an electromagnetic beam to pass through and reflects the rest. Beamsplitters can be cemented right prisms or partially silvered mirrors.



A **waveguide** is a rectangular or cylindrical tube that propagates radio waves or microwaves. They are mostly found in magnetic resonance spectrometers. **Fiber optics** can be thought of as a waveguide for visible light.